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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/476,092	01/03/2000	DAVID F. SORRELLS	1744.0250001	7304

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EXAMINER

MEHRPOUR, NAGHMEH

ART UNIT	PAPER NUMBER
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2686

DATE MAILED: 05/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/476,092

Applicant(s)

SORRELLS ET AL.

Examiner

Naghmeh Mehrpour

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 06 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 19-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 12-18 and 26-28 is/are allowed.
- 6) ☒ Claim(s) 1-11 and 19-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/7/05, 11/18/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed reference listed in the information disclosure submitted on 11/24/04, 3/7/05, have been considered by the examiner (see attached PTO-1449).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1-6, 9-11, 19-22**, are rejected under 35 U.S.C. 102(b) as being anticipated by Jensen (US Patent number 2003/0091781 A1).

Regarding **Claim 1**, Jensen teaches method for down-converting a frequency modulated (FM) signal, comprising (See figure 1) the steps of

(1) aliasing the FM signal at an aliasing rate, said aliasing rate being determined by the frequency of the FM signal (page 8 section 0072);

(2) adjusting said aliasing rate 50 to compensate for frequency changes of the FM signal (page 5 section 0057);

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(3) outputting, responsive to steps (1) and (2), a demodulated baseband information signal, **wherein the aliasing rate is based upon the demodulated baseband information signal** (Page 6 section 0064).

Regarding **Claim 2**, Jensen teaches wherein step (1) comprises:

aliasing the FM signal at an aliasing rate that is substantially equal to a sub-harmonic of a frequency of the FM signal (page 6 section 0064, page 7 section 0065).

Regarding **Claim 3**, Jensen teaches adjusting the aliasing rate in accordance with frequency changes of FM signal to maintain the aliasing rate substantially equal to the frequency of the FM signal (page 5 section 0051, page 8 section 0072).

Regarding **Claim 4**, Jensen teaches a method further comprising the step of compensating for phase delays to maintain bandwidth and stability (page 6 section 0058).

Regarding **Claim 5**, Jensen teaches a method wherein step (5) comprises:

(a) compensating for phase delays to maintain stability by adjusting said control signal to create a compensated control signal (page 6 section 0058); and

(b) creating said aliasing signal using said compensated control signal (page 6 section 0058).

Regarding **Claims 6, 10**, Jensen teaches a method for directly down converting 25 frequency modulated (FM) signal having a carrier frequency, comprising the steps of:

(1) aliasing the FM signal 22 with a first local oscillator signal to create a first down-converted 25 signal, said first LO 23 signal having a first LO frequency and a first LO phase (col 2 lines 56-61);

(2) aliasing the FM signal with a second LO signal to create a second down-converted signal 26, said second LO plus 90 degrees signal having a second LO frequency and a second LO

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phase wherein said second LO frequency is substantially the same as said first LO frequency, and wherein said second LO phase is shifted relative to said first LO phase (page col 2 lines 50-67, col 3 lines 1-19);

(3) combining said first down-converted signal and said second down--converted signal to create a converter signal (page 5 section 0053);

(4) integrating said signal to create a control signal (see figure 1, page 5 section 0053);

(5) **generating the first and second LO signals based on the control signal** (page 6 section 0058); and

(6) outputting, the control signal as a demodulated baseband information signal (se figure 1, page 5 section 0053)

Regarding **Claim 9**, Jensen teaches a method wherein step (5) comprises:

(a) compensating for phase delays to maintain stability by adjusting said control signal to create a compensated control signal 35 (see figure 1, page 6 section 0058); and

(b) creating said **first and second LO signals** using said compensated control signal (page 6 section 0058).

Regarding **Claim 11**, Jensen teaches adjusting the aliasing rate in accordance with frequency changes of FM signal to maintain **the first and second LO signals are** substantially equal to the frequency of the FM signal (page 6 section 0058).

Regarding **Claim 19**, Jensen teaches a method for directly down converting frequency modulated (FM) signal having a carrier frequency, comprising the steps of:

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- (1) aliasing the FM signal 22 with a first local oscillator (LO) signal to create a first down-converted signal (col 2 lines 51-56), said first LO signal having a first LO frequency and a first LO phase (col 2 lines 56-61);
- (2) aliasing the FM signal with a second LO signal to create a second down-converted signal said second LO signal having a second LO frequency and a second LO phase wherein said second LO frequency is substantially the same as said first LO frequency, and wherein said second LO phase is shifted relative to said first LO phase (page 6 section 0058).

Regarding **Claim 20**, teaches a method wherein the step (3) comprises the step of:

- (a) summing the first and the second down-converted signals to generate a summation signal (page 5 section 0053); and
- (b) integrating the summation signal to generate from the control signal (see figure 1, page 3 section 0053)

Regarding **Claim 21**, Jensen teaches a method wherein step (4) comprises the step of: adjusting said control signal to maintain said mixer 28 signal at a value substantially equal to zero (page 6 section 0058).

Regarding **Claim 22**, teaches a method wherein further comprises the step of:

maintaining the first second LO signals such that one of the first and second LO signals leads the FM signal, and another of the first and second LO signals (page 6 sections 0058-0059).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 7-8**, are rejected under 35 U.S.C. 103(a) as being unpatentable over Jensen (US Patent 5,606,731) in view of Mishima et al (US Patent Number 5,600,680).

Regarding **Claims 7-8**, Jensen teaches a method wherein said second LO phase is shifted relative to said first LO phase by an amount that is substantially equal to one-half period of the FM signal. Jensen does not show that second LO phase shift relative to the first LO by amount of one-quarter. However Mishima shows that second LO phase is shifted relative to said first LO phase by an amount that is substantially equal to one-quarter period of the signal (See figure 1, numerals 12, 15). Therefore, it would have been obvious to ordinary skill in the art at the time the invention was made to use one-half or one-quarter or equal to any multiple of a period of the FM signal plus one-quarter period of the FM signal, in order to provide zero-IF receiver circuit that eliminate the time delay.

Allowable Subject Matter

6. **Claims 12-18, 26-28**, are allowed.

7. The followings a statement of reasons for the indication of allowable subject matter: Regarding claim 12, the present application teaches a first aliasing module and second aliasing module to alias the FM signal and a summing module to combine the first signals and the second signal to create a summation signal as specifically mentioned in claim 12.

Response to Arguments

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8. Applicant's arguments with respect to claims 1-28 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. **Any responses to this action should be mailed to:**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Naghmeh Mehrpour whose telephone number is 571-272-7913.

The examiner can normally be reached on 8:00- 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold be reached (571) 272-7905.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NM

May 6, 2005



**MELODY MEHROUR
PATENT EXAMINER**